GOVERNMENT OF BRITISH COLUMBIA

MEMORANDUM

TO Mr. A. P. Kohut
Senior Geological Engineer
Groundwater Section

FROM H. H. Choy
Geological Engineer
Groundwater Section

April 12 19 77

SUBJECT Scott Point Groundwater Supply, Saltspring Island

OUR FILE 0239013

YOUR FILE

Upon the request of Mr. H. D. DeBeck, Comptroller of Water Rights, in his memorandum on the above subject, dated March 21, 1977, the existing groundwater data of Scott Point Peninsula and the adjoining peninsula were reviewed. Field investigations on the geology and local groundwater discharge conditions were carried out on March 31 and April 1, 1977. The present water supply system and potential for future exploration work for Scott Point were discussed with Mr. Taylor, a trustee with the Scott Point Waterworks District. Mr. Taylor mentioned one of the existing water supply wells was subject to salt water intrusion, especially in the dry summer months. Residents of Scott Point are ready to explore possible water sources outside the peninsula to meet their total present requirement of 10 to 15 gallons per minute, thereby allowing for recovery of water quality and also recharge of the aquifer in the Scott Point Peninsula.

Geology:

Scott Point and the adjoining peninsula are underlain by rocks of the Nanaimo Group of late Cretaceous age (Figure 1). This group is a sequence of sandstone, shale and conglomerate. The sandstones are grey, fine-grained, massive and are found in topographically positive areas. The shales are black, massive and concretionary found in topographically subdued areas. Conglomerate, composed of poorly sorted, rounded pebbles in a sandstone matrix occurs along the south coast of the Scott Point Peninsula and on the upland, north of the Long Harbour-Vesuvius Bay Road.

Surficial deposits of argillaceous sands and gravels are reported along the axis of the valley, parallel to the Long Harbour-Vesuvius Road. One well record indicates forty feet of the surficial deposits.

Locally, the bedrock is folded, fractured and faulted. Two sets of vertical joints trending northeast and northwest and a horizontal joint set dipping approximately 30° southeast are observed to be prominent in the sandstone. The shale appears to be tighly folded and compressed with less obvious joints.

Hydrogeological Data:

Existing well data coupled with field observations were compiled, interpretated and presented in Figure 2. The yield probabilities of the area are

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estimated from the available well records. The resultant yield from over 80% of the existing wells is low, generally less than 5 gallons per minute.

No wells have been drilled in the central valley and the higher hills north of the Long Harbour-Vesuvius Bay Road. In the field, groundwater generated phenomena such as seeps, low yield springs, swamps and a pond reflecting discharge conditions were observed only in areas topographically lower than the adjacent areas. These phenomena demonstrate the ascending groundwater movement by gravity flow through fractures in the Scott Point area and adjoining peninsula. Topographically high areas, which are the recharge areas, are not ideal for groundwater exploration because of accessibility, deep drilling required and possible large magnitude of seasonal fluctuation in water levels .

Conclusions and Recommendations:

The possibilities of obtaining an adequate potable source of water supply in the Scott Point Peninsula is unpromising. The recharge to Scott Point is restricted and the limited width of the Peninsula allows for induced sea water intrusion into the aquifer at high rates of groundwater production.

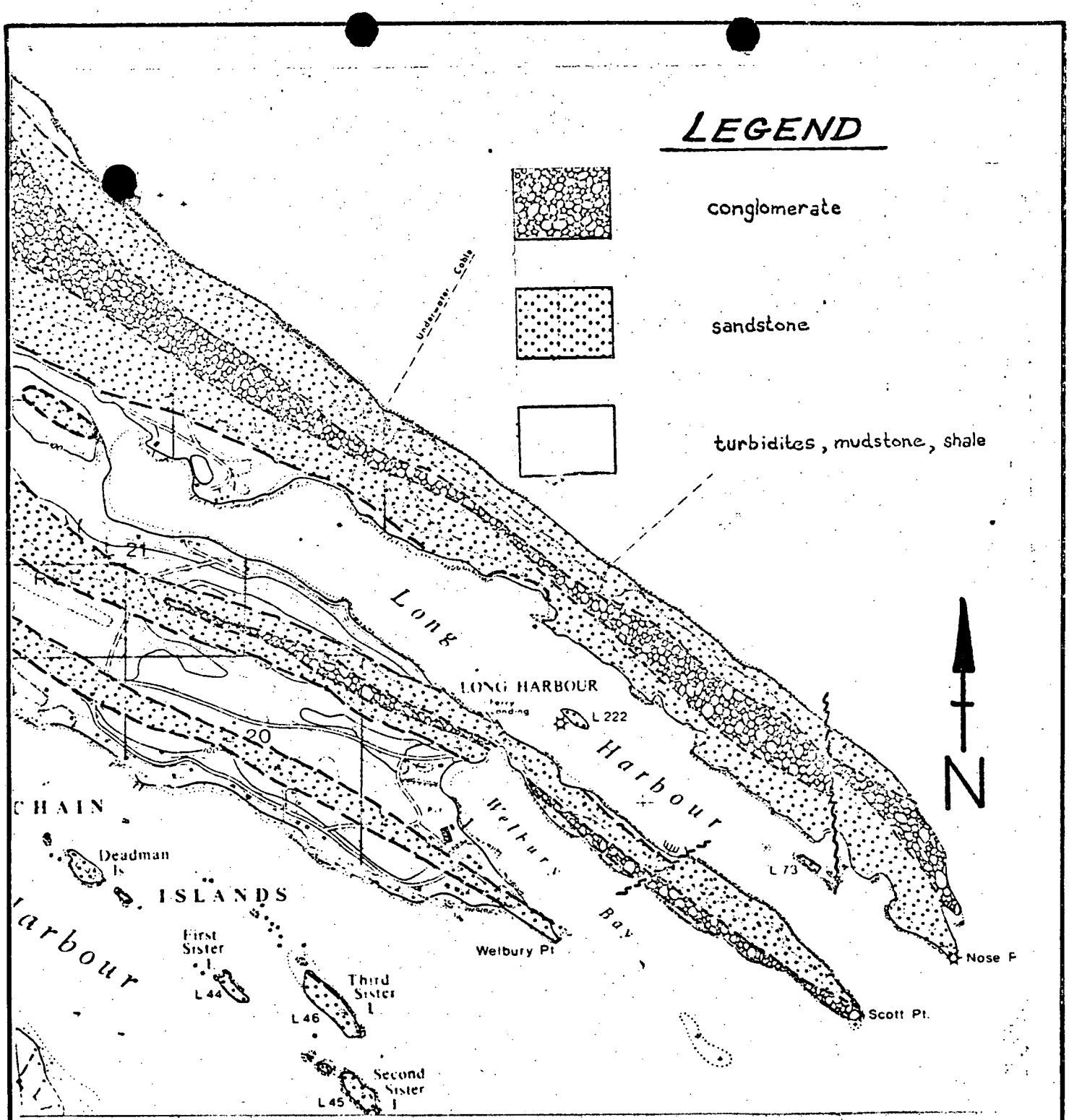
Probability of obtaining water supplies outside the Scott Point Peninsula are more encouraging. The area along the axis of the valley outlined in Figure 2 is a favourable area for drilling exploration. This recommended exploration area is determined partly on the existing neighbouring well yields, probability data and partly on the indications of groundwater discharge from air photo analysis, field observations and topography. Although the geological environment may not allow for a high yield production well completed in the surficial clayey sands and gravels or the bedrock shale, a system of production wells in the recommended area may provide a reliable source of water supply for the Scott Point Peninsula. Three proposed sites for test drilling are shown, for example, in Figure 2. Flexibilities in the site locations should be allowed, depending upon local topographic control, accessibility and ease of obtaining suitable land agreements.

Test drilling with a cable tool drilling rig to a maximum depth of 250 feet is recommended. Before drilling into the bedrock shale, the potential of the surficial sands and gravels as an aquifer should be evaluated. Since no pump test information is available in the recommended area, any completed wells should be pump tested for at least 72 hours at a constant rate at or in excess of the desired production rate. This long-term test is necessary to evaluate the yield of bedrock wells and access any possible boundary conditions in the aquifer. Any anticipated production beyond the tested rate may necessitate a retesting of the well at a later date. Pump testing should be conducted, moveover, during late summer when the water level is seasonally at its minimum.

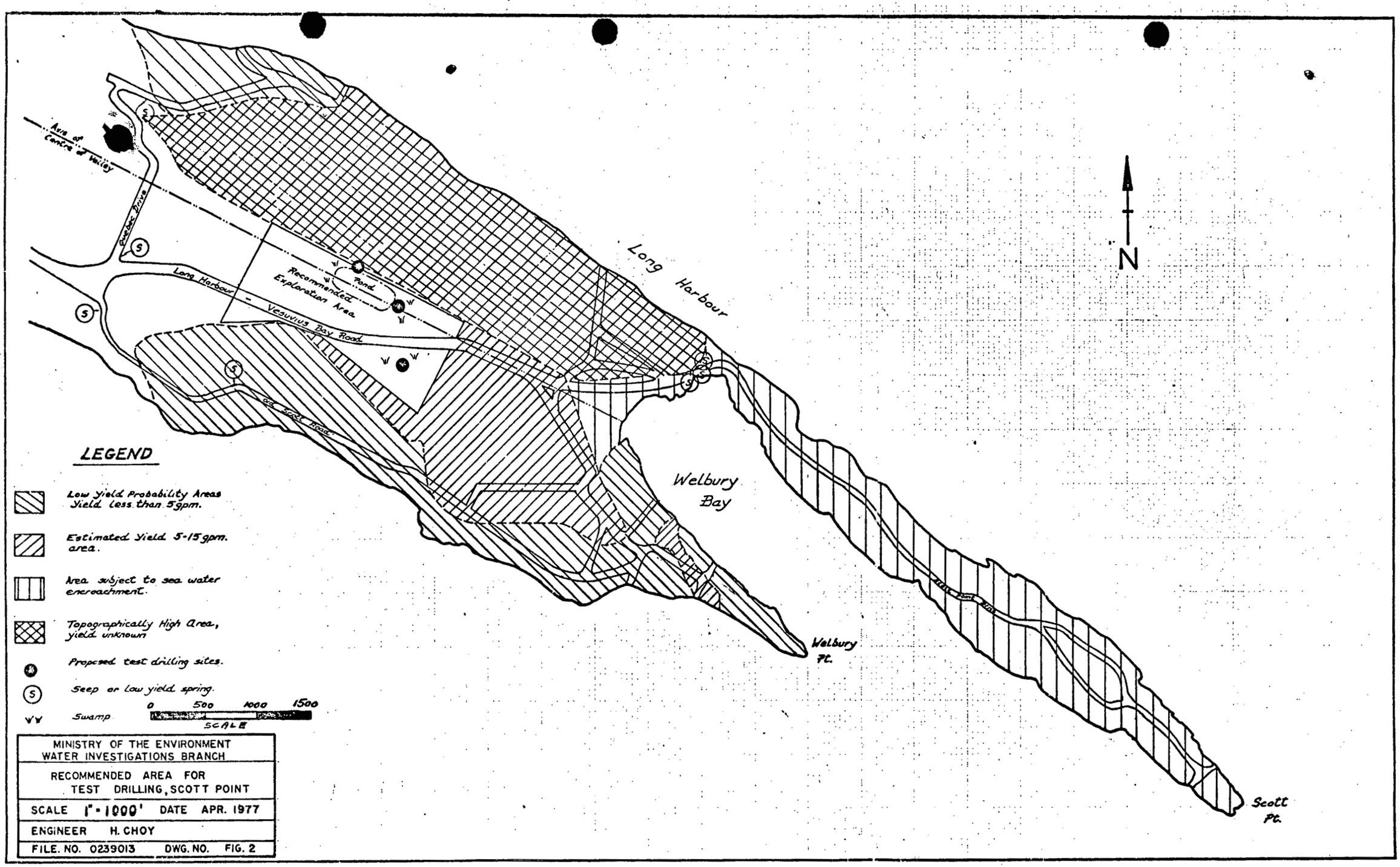
Hugh Choy

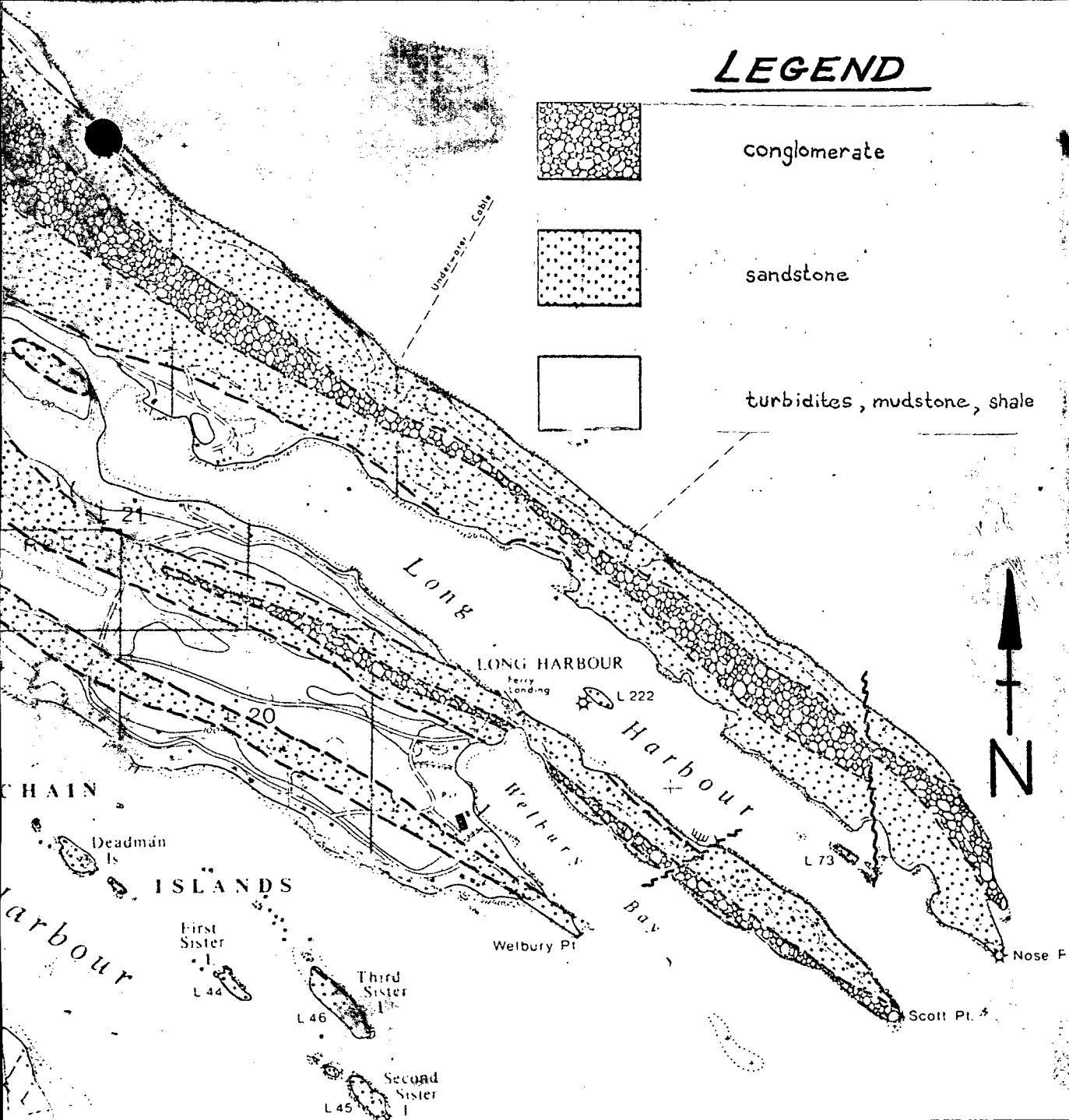
H. Choy

HHC:11



MINISTRY OF THE ENVIRONMENT WATER INVESTIGATIONS BRANCH	TO ACCOMPANY REPORT ON BEDROCK GEOLOGY SCOTT POINT REGION
SCALE: VERT. ____ HOR. 1" = 2000' DATE APR. 1977	H. CHOY ENGINEER FILE No. 0239013 DWG. No. FIG. 1


Area of Centre of Valley
Outlet River
Long Harbour - Vesuvius Bay Road
Recommended Exploration Area
Pond
Long Harbour
Welbury Bay
Welbury Pt.
Scott Pt.
N
LEGEND
Low yield Probability Areas Yield less than 5gpm.
Estimated Yield 5-15gpm. area.
Area subject to sea water encroachment.
Topographically High Area, yield unknown
Proposed test drilling sites.
Seep or low yield spring.
Swamp
0 500 1000 1500
SCALE
MINISTRY OF THE ENVIRONMENT
WATER INVESTIGATIONS BRANCH
RECOMMENDED AREA FOR TEST DRILLING, SCOTT POINT
SCALE 1" = 1000' DATE APR. 1977
ENGINEER H. CHOY
FILE. NO. 0239013 DWG. NO. FIG. 2


LEGEND
conglomerate
sandstone
turbidites, mudstone, shale
Undersea Cable
21
20
Long
Harbour
LONG HARBOUR
Ferry Landing
L 222
L 73
Welbury Bay
Welbury Pt
Nose P
Scott Pt.
N
CHAIN
Deadman Is
ISLANDS
First Sister I
L 44
Third Sister I
L 46
Second Sister I
L 45
Harbour

MINISTRY OF THE ENVIRONMENT

WATER INVESTIGATIONS BRANCH

TO ACCOMPANY REPORT ON

BEDROCK GEOLOGY
SCOTT POINT REGION

SCALE: VERT.

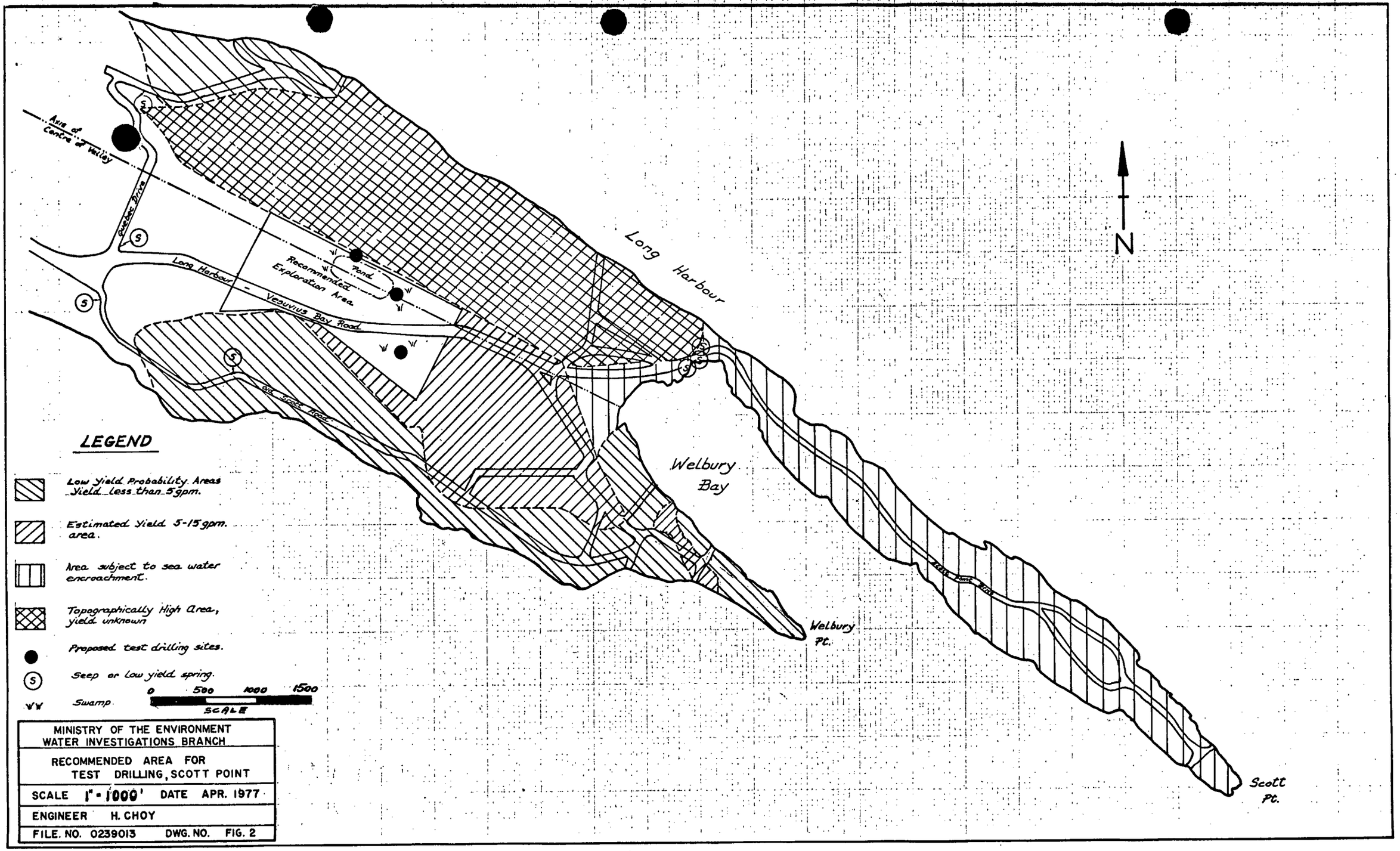
HOR. 1" = 2000'

DATE

APR. 1977

H. CHOY ENGINEER

FILE No. 0239013 DWG. No. FIG. 1


Axis of Centre of Valley
Pocket Drive
Long Harbour - Vesuvius Bay Road
Old Scott Road
Recommended Exploration Area
Pond
Long Harbour
Welbury Bay
Welbury Pt.
Scott Pt.
N
LEGEND
Low Yield Probability Areas Yield less than 5 gpm.
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0 500 1000 1500
SCALE
MINISTRY OF THE ENVIRONMENT
WATER INVESTIGATIONS BRANCH
RECOMMENDED AREA FOR TEST DRILLING, SCOTT POINT
SCALE 1" = 1000' DATE APR. 1977
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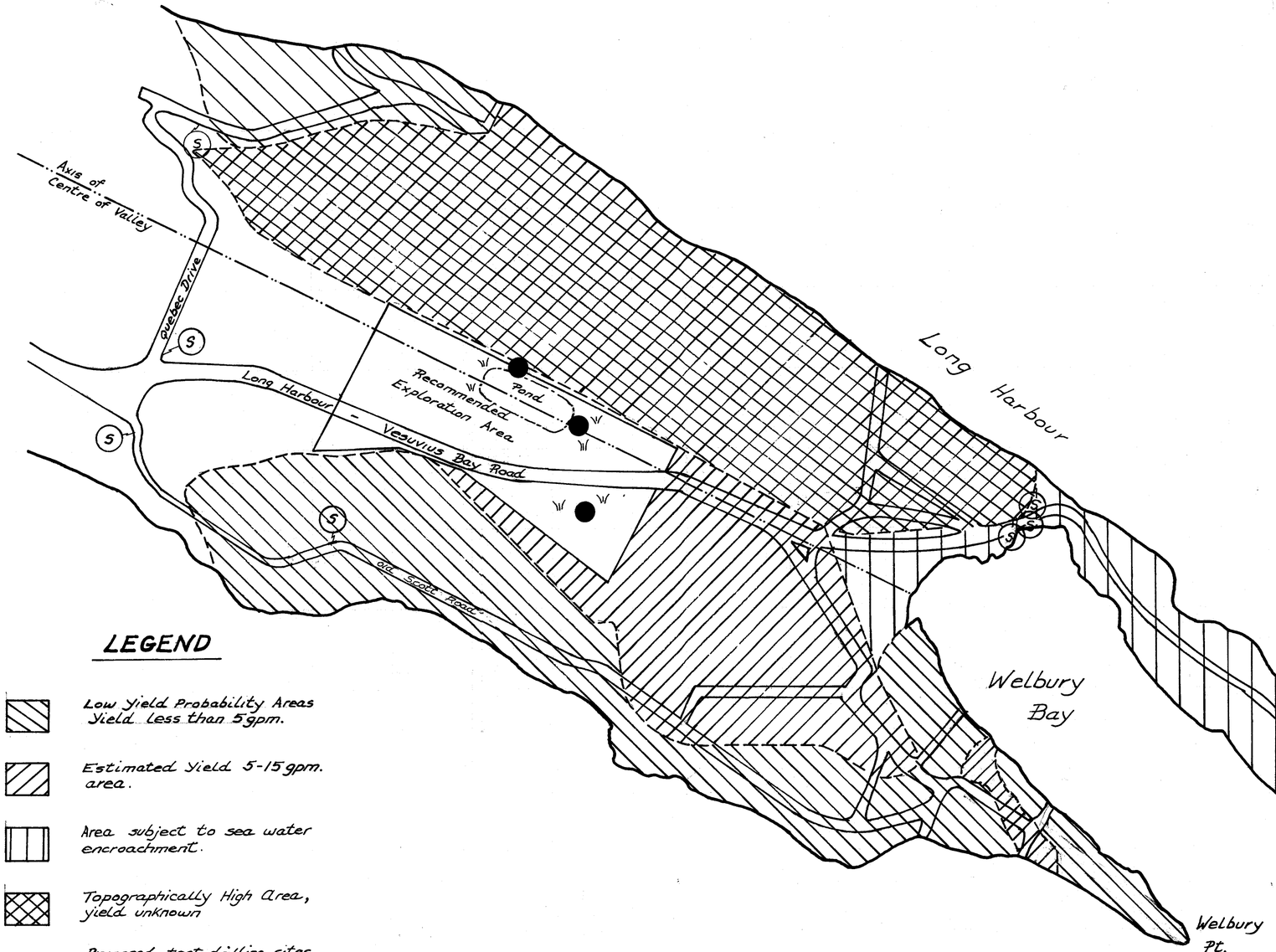
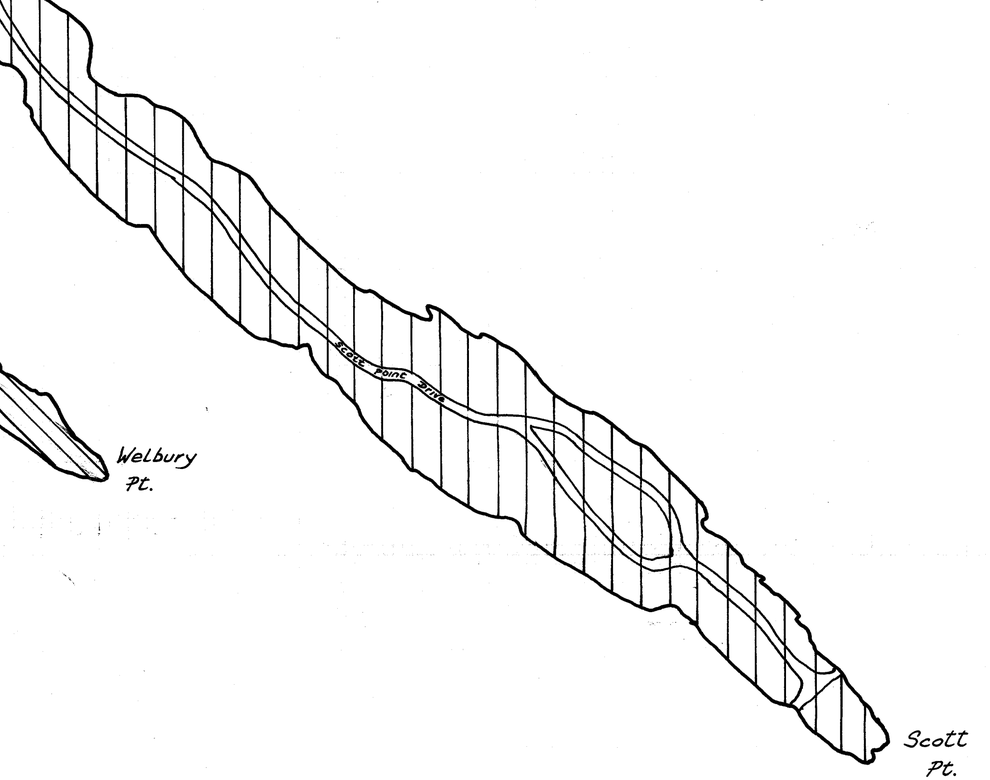
FILE. NO. 0239013 DWG. NO. FIG. 2





LEGEND

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- Swamp.

MINISTRY OF THE ENVIRONMENT WATER INVESTIGATIONS BRANCH	
RECOMMENDED AREA FOR TEST DRILLING, SCOTT POINT	
SCALE 1" = 500'	DATE APR. 1977
ENGINEER H. CHOY	
FILE. NO. 0239013	DWG. NO. FIG. 2